

SYSTEMS, METHODS AND COMPUTER PROGRAM PRODUCTS FOR
PRODUCING NARRATIVE FINANCIAL ANALYSIS REPORTS

Field of the Invention

5 The present invention relates generally to financial analysis and, more particularly, to systems, methods, and computer program products for performing financial analysis.

Related Applications

10 This application claims the benefit of U.S. Provisional Application No. 60/163,502, filed November 3, 1999.

Background of the Invention

15 Financial analysis involves the use of various financial formulas (ratios) to measure the financial strengths and weaknesses of a company and to compare these strengths and weaknesses with those of other companies within an industry. Financial analysis information may be valuable to those within a company (e.g., officers, and financial managers) and to those
20 outside of a company (e.g., investors, creditors, and security analysts).

Financial ratios are designed to show

relationships between various financial statement accounts. For example, Company A may have debt of \$4,000,000 and interest charges of \$700,000, while Company B may have debt of \$64,000,000 and interest charges of \$7,700,000. The actual burden of these debts, and the companies' ability to repay them, can be determined by comparing each company's debt to its assets, and the interest each company is charged to the income available for payment of interest. Such comparisons are made by a procedure known as "ratio analysis."

Various known categories of ratios include liquidity ratios, asset management ratios, debt management ratios, profitability ratios, and market value ratios. Liquidity ratios are designed to show the relationship of cash and other current assets to a company's current obligations. Asset management ratios are designed to measure how effectively a company is utilizing its assets. Debt management ratios are designed to measure the extent to which a company uses debt financing. Profitability ratios are designed to show the combined effects of liquidity, asset management, and debt management on operating results. Market value ratios are designed to relate the stock price of a company to the company's earnings and book value per share.

Ratio analysis may allow a financial manager to compare his or her company's financial performance with the financial performance of other companies in the same industry. In addition, trends in ratio

analysis may allow a financial manager to analyze changes in a company's financial performance over time. Ratio analysis may give clues as to whether the financial situation of a company is improving or deteriorating. Financial analysis and, in particular, ratio analysis is discussed in detail in "Essentials of Managerial Finance", Weston et al., The Dryden Press, 1987, pp. 252-259, which is incorporated herein by reference.

Performing financial analysis and interpreting results from financial analysis may be a somewhat daunting task, especially to those untrained in managerial finance. For example, to some it may not be clear how to utilize ratio analysis in assessing the financial health of a company. Moreover, it may be difficult for some to compare the financial performance of their company to the financial performance of other companies.

Financial analysis services are available from various professional advisors, such as consultants and accountants. Unfortunately, these services may be expensive. As such, professional financial analysis services may be out of reach of smaller investors and business owners.

Various financial software products and services exist that can analyze one or more of the four basic financial statements (i.e., the income statement, balance sheet, statement of retained earnings, and statement of changes in financial position). For example, Entrepreneurial Edge Online

(www.edgeonline.com) is a service of the Edward Lowe Foundation (P.O. Box 8, Cassopolis, MI 49031) that provides on-line forms in which users can enter data. Using the user-provided financial data, various ratios and financial statements can be generated. For example, a balance sheet can be generated and ratios such as liquidity, operating and solvency ratios can also be generated.

CPAnalyst financial software, available from the Illinois CPA Society (www.icpas.org) is configured to receive financial data from users and convert this data into various types of output, including financial statements, ratios, graphs and limited narrative reports. The narrative reports, however, consist of templates having fields within which financial data, including financial ratio values are inserted. The written description in each narrative report is identical for each output report.

In addition, existing financial analysis products and services may be somewhat limited in the depth of analysis that can be produced. Moreover, existing financial analysis products and services may not be able to indicate how a company is performing relative to the competition and how the company might improve performance.

Summary of the Invention

In view of the above discussion, the present invention provides systems, methods, and computer program products for producing narrative financial

analysis reports for business entities. According to
embodiments of the present invention, a web server at
an intermediary web site receives, from a client
device, financial and/or other information about a
5 business entity for one or more selected time periods.
A set of financial values are calculated for the
received financial information for each of the selected
time periods. Each financial value in a set is
calculated from a respective one of a plurality of
10 financial formulas. Exemplary financial formulas may
include, but are not limited to, liquidity ratios,
asset management ratios, debt management ratios,
profitability ratios, and market value ratios.

At least one of the financial values in each
15 set is compared with one or more financial values
associated with other business entities within a
selected industry. A score is assigned to one or more
of the financial values in each set. Each assigned
score reflects an assessment of financial performance
20 of the business entity relative to other business
entities within the selected industry. In addition,
assigned scores for multiple time periods may be
compared with each other to assess changes in financial
performance from one time period to another time
25 period.

One or more portions of stored text that are
associated with one or more combinations of assigned
scores are then selected from a database. A document is
built with the one or more portions of selected text to
30 generate a narrative financial analysis report for the

business entity. The generated narrative financial analysis report is then transmitted to a client device of a user via a computer network, such as the Internet.

5 The present invention is designed to allow users to quickly input various financial data and answer various questions within a user-friendly interface, and then receive a custom narrative financial analysis report. The present invention may enhance managerial decision making by taking financial data and converting the financial data into relevant and practical analysis and recommendations. Furthermore, the present invention may complement the advice and recommendations received from professional advisors.

Brief Description of the Drawings

15 **Fig. 1** is a block diagram that illustrates a system for producing narrative financial analysis reports for business entities, according to embodiments of the present invention.

20 **Fig. 2** is a flow chart illustrating operations for producing narrative financial analysis reports for business entities, according to embodiments of the present invention.

25 **Figs. 3A-3C** illustrate exemplary HTML data entry forms for use in obtaining financial data from users in accordance with embodiments of the present invention.

Figs. 4A-4K illustrate an exemplary narrative financial analysis report generated in accordance with embodiments of the present invention.

5

Glossary

Accounting: A method of gathering financial information and reporting on the activities of a business.

Accounts Payable: Amounts owed to suppliers.

10

Accounts Receivable: Amounts that customers owe for services rendered.

Assets: Resources that a company owns or holds such as buildings, machinery, and inventory. Assets are listed on the Balance Sheet.

15

Balance Sheet: A listing of a company's assets, liabilities, and equity as of a certain date.

Cash: The total funds available in financial (checking, savings, and marketable securities) accounts.

20

Cash Flow Forecast: A projection of how much money is expected to come in and go out of a company.

Cash Flow Statements: Reports of cash inflows and outflows for a particular period of time.

25

Cost of Sales (Cost of Goods Sold): The direct cost of products and services sold.

Current Assets: Assets held for a short period of time before they are put into a business, like cash, accounts receivable, inventory, marketable securities, and prepaid expenses.

30

Current Liabilities: Amounts owed to others

which must be paid for in the short term—usually within a year. Accounts payable is a common current liability. Current liabilities are accrued expenses—built-up expenses.

5 **Debt (liability):** An obligation to pay money that is due under specified terms. Debt is an amount owed as of a certain date.

Equity (owner's equity, net worth, shareholders' equity): The recorded ownership claim of
10 common and preferred shareholders in a corporation as reflected on the balance sheet. It's defined as total assets minus total liabilities.

Expenses: The costs of doing business measured over a certain period of time.

15 **Fiscal Year:** Twelve-month period during which a company reports income and expenses. Most companies use January 1 to December 31 for their fiscal year.

Fixed Costs: Any costs or expenses that don't vary too much with changes in the volume of operations
20 over a specified time. Rent expense is usually a fixed expense.

General & Administrative Costs (G&A):
Overhead costs like rent, utilities, staff personnel, professional fees, and depreciation.

25 **Gross Fixed Assets:** Any assets on a balance sheet considered to have a life or usefulness in excess of one year. Common examples include land, buildings, and machinery. Gross Fixed Assets do not include depreciation.

30 **Gross Profit:** The difference between Sales

and Cost of Sales.

Gross Profit Margin: Gross Profit divided by Sales.

5 **Income Statement:** Shows sales, expenses, and profits or losses for a certain period of time. The income statement is also referred to as a profit/loss statement.

Inventory: The value of goods made or purchased for resale.

10 **Net Profit Before Taxes:** What is left over after all expenses are paid except income taxes.

Operating Expenses: Expenses which are paid from the gross profits of a company. They are often referred to as General & Administrative or Overhead Expenses.

Principal: The original amount of a loan. The rate of interest is based on the original amount of the loan.

20 **Ratio Analysis:** The use of a variety of ratios in analyzing the financial performance and condition of a company.

Sales: Revenues a company earns (sometimes referred to as gross sales) before expenses. Sales are measured by time.

25 **Total Assets:** The total amount of assets as of a certain date. Total assets equal current assets plus fixed assets. Fixed assets are long-term assets like buildings and machinery.

Total Employees + Full time Contractors:
30 Full-time staff and full-time contractors; sometimes

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Hypertext Transfer Protocol (HTTP) via a Transmission Control Protocol/Internet Protocol (TCP/IP) connection between a client-hosting device and a server-hosting device. While HTTP and web pages are the prevalent forms for the Web, the Web itself refers to a wide range of protocols including Secure Hypertext Transfer Protocol (HTTPS), File Transfer Protocol (FTP), and Gopher, and web content formats including plain text, HyperText Markup Language (HTML), Extensible Markup Language (XML), as well as image formats such as Graphics Interchange Format (GIF) and Joint Photographic Experts Group (JPEG).

A web site is conventionally a related collection of web files that includes a beginning file called a "home" page. From the home page, a visitor can access other files and applications at a web site. A large web site may utilize a number of servers, which may or may not be different and which may or may not be geographically-dispersed. For example, the web site of the International Business Machines Corporation (www.ibm.com) consists of thousands of web pages and files spread out over multiple web servers in locations world-wide.

A web server (also referred to as an HTTP server) is a computer program that utilizes HTTP to serve files that form web pages to requesting web clients. Exemplary web servers include International Business Machines Corporation's family of Lotus Domino® servers, the Apache server (available from www.apache.org), and Microsoft's Internet Information

Server (IIS), available from Microsoft Corporation, Redmond, Washington. A web client is a requesting program that also utilizes HTTP. A browser is an exemplary web client for use in requesting web pages and files from web servers. A web server waits for a web client, such as a browser, to open a connection and to request a specific web page or application. The web server then sends a copy of the requested item to the web client, closes the connection with the web client, and waits for the next connection.

HTTP allows a browser to request a specific item, which a web server then returns and the browser renders within a display screen. To ensure that browsers and web servers can interoperate unambiguously, HTTP defines the exact format of requests (HTTP requests) sent from a browser to a web server as well as the format of responses (HTTP responses) that a web server returns to a browser. Exemplary browsers that can be utilized by users accessing an intermediary web site according to the present invention include, but are not limited to, Netscape Navigator® (America Online, Inc., Dulles, VA) and Internet Explorer™ (Microsoft Corporation, Redmond, WA). Browsers typically provide a graphical user interface for retrieving and viewing web pages, applications, and other resources served by web servers.

As is known to those skilled in this art, a web page is conventionally formatted via a standard page description language such as HTML, which typically

contains text and can reference graphics, sound, animation, and video data. HTML provides for basic document formatting and allows a web content provider to specify anchors or hypertext links (typically manifested as highlighted text) to other servers. When a user selects (i.e., activates) a particular hypertext link, a browser running on the user's client device reads and interprets an address, called a Uniform Resource Locator (URL) associated with the hypertext link, connects the browser with a web server at that address, and makes a request (e.g., an HTTP request) for the file identified in the hypertext link. The web server then sends the requested file to the client device which the browser interprets and renders within a display screen.

As will be appreciated by one of skill in the art, the present invention may be embodied as methods, data processing systems, and/or computer program products. Accordingly, the present invention may take the form of an entirely hardware embodiment, an entirely software embodiment or an embodiment combining software and hardware aspects. Furthermore, the present invention may take the form of a computer program product on a computer-usable storage medium having computer-usable program code embodied in the medium. Any suitable computer readable medium may be utilized including hard disks, CD-ROMs, optical storage devices, or magnetic storage devices.

Computer program code for carrying out operations of the present invention may be written in

an object oriented programming language such as JAVA®, Smalltalk or C++. The computer program code for carrying out operations of the present invention may also be written in conventional procedural programming languages, such as "C", JavaScript, Visual Basic, TSQL, Perl, or in various other programming languages. Software embodiments of the present invention do not depend on implementation with a particular programming language. Portions of the program code may execute entirely on one or more data processing systems utilized by a web site.

Program code for carrying out aspects of the present invention may execute entirely on one or more servers, or it may execute partly on a server and partly on a client within a client device (i.e., a user's web client), or as a proxy server at an intermediate point in a communications network. In the latter scenario, a client device may be connected to a server through a LAN or a WAN (e.g., an intranet), or the connection may be made through the Internet (e.g., via an Internet Service Provider). The communication protocols are defined at the application level, and they are intended to be implemented over the TCP/IP Internet Protocol Suite. However, the present invention is not TCP/IP-specific, and therefore it may be embodied using a protocol suite that is functionally equivalent to TCP/IP.

The present invention is described below with reference to block diagram and/or flowchart illustrations of methods, apparatus (systems) and

computer program products according to an embodiment of the invention. It is understood that each block of the block diagram and/or flowchart illustrations, and combinations of blocks in the block diagram and/or flowchart illustrations, can be implemented by computer program instructions. These computer program instructions may be provided to a processor of a general purpose computer, special purpose computer, or other programmable data processing apparatus to produce a machine, such that the instructions, which execute via the processor of the computer or other programmable data processing apparatus, create means for implementing the functions specified in the block diagram and/or flowchart block or blocks.

These computer program instructions may also be stored in a computer-readable memory that can direct a computer or other programmable data processing apparatus to function in a particular manner, such that the instructions stored in the computer-readable memory produce an article of manufacture including instruction means which implement the function specified in the block diagram and/or flowchart block or blocks.

The computer program instructions may also be loaded onto a computer or other programmable data processing apparatus to cause a series of operational steps to be performed on the computer or other programmable apparatus to produce a computer implemented process such that the instructions which execute on the computer or other programmable apparatus provide steps for implementing the functions specified

in the block diagram and/or flowchart block or blocks.

Referring now to **Fig. 1**, a system 10 for producing a narrative financial analysis report for a business entity, according to an embodiment of the present invention, is illustrated. The system 10 includes a web site 12 of an intermediary that is configured to receive financial information from users and to generate narrative financial analysis reports based on the received financial information. The illustrated intermediary web site 12 includes a web server 14 and a database 16. Although a single web server 14 and a single database 16 are illustrated, it is understood that multiple web servers and multiple databases may be utilized to perform the various functions of the intermediary web site 12. Moreover, the functionality of the web server 14 and/or the database 16 may be integrated together.

The web server 14 is the "front end" component of the intermediary web site 12 and is configured to handle various client requests from users accessing the intermediary web site 12. Exemplary web servers that may be utilized as a web server 12 in the illustrated system 10 include, but are not limited to, Apache, available from the Apache Server Project, <http://www.apache.org>; Microsoft's Internet Information Server (IIS), available from Microsoft Corporation, Redmond, Washington; and Netscape's FastTrack® and Enterprise™ servers, available from America Online, Inc., Dulles, Virginia. Other web servers that may be utilized include Novell's web Server for users of its

NetWare® operating system, available from Novell, Inc., San Jose, California; and IBM's family of Lotus Domino® servers, available from International Business Machines Corporation, Armonk, New York.

5 As is known by those of skill in the art, a database is a collection of data that is organized in "tables." A database typically includes a database manager that facilitates accessing, managing, and updating data within the various tables of a database.

10 Exemplary types of databases that can be utilized to perform the various functions of the illustrated database 16, according to the present invention, include relational databases, distributed databases (databases that are dispersed or replicated among

15 different points in a network), and object-oriented databases. Relational, distributed, and object-oriented databases are well understood by those of skill in the art and need not be discussed further herein. Exemplary databases that can be utilized to perform the various

20 functions of the illustrated database 16 include, but are not limited to, IBM's DB2® database, Microsoft's SQL server database, and database products from Oracle, Sybase, and Computer Associates.

 A database server (not illustrated) may be

25 utilized to serve as a "middleman" server between the web server 12 and the database 16. As is known to those of skill in the art, a database server includes program code and logic for retrieving data from databases (and from sources external to a web site) in response to

30 requests from a web server. Exemplary database servers

that may be utilized as a database server in the illustrated system 10 include, but are not limited to, Microsoft's SQL server, IBM DB2® Universal Database server, and the WebSphere™ Net.Commerce server, the latter two being available from International Business Machines Corporation, Armonk, New York.

The illustrated intermediary web site 12 is configured to communicate with users accessing the intermediary web site 12 via a client program, such as a browser, running on a client device 18, such as a personal computer. However, it is understood that electronic devices including, but not limited to, wireless communications devices, personal digital assistants (PDAs), hand-held computers, Internet-ready phones, and WebTVs, may be utilized as client devices 18 for communication with the web server 14 of the intermediary web site 12 in accordance with the present invention. A browser running on each client device 18 communicates with the web server 14 of the intermediary web site 12 via a communications network 20, such as the Internet.

According to an embodiment of the present invention, the web server 14 includes one or more applications configured to retrieve financial data from a user, to analyze and manipulate the financial data, to retrieve portions of text from the database 16, to generate a narrative financial analysis report with the retrieved text portions, and to serve the generated narrative financial analysis report to a user. An exemplary application for performing these functions is

a Common Gateway Interface (CGI) application. As is understood by those of skill in the art, CGI is a standard that allows clients to interface with various applications via web servers. A web server processes a client CGI request using a CGI script or application. For example, when a database is queried by a client, a web server acts as a gateway between the database and the client. The web server transmits the client request to a CGI application that performs the database query, formats the results and returns HTML-formatted data to the web server. The web server then transmits the HTML-formatted data to the client for display to the user.

It is understood that the present invention is not limited to the use of CGI applications. For example, Microsoft Active Server Pages (ASP) technology and Java Server Pages (JSP) technology may be utilized to retrieve and transmit information from and to a client device in accordance with embodiments of the present invention.

It is also understood that the present invention may be implemented using a standalone workstation, personal computer, and/or mainframe computer. The present invention may be implemented via an intranet or other private network, as well.

Referring now to **Fig. 2** operations for producing narrative financial analysis reports for business entities according to embodiments of the present invention are illustrated. Initially, a web server 14 at an intermediary web site 12 receives, from a client device, financial and/or other information

about a business entity for one or more selected time periods (Block 100). A set of financial values are calculated for the received financial information for each of the selected time periods (Block 200). As will be described in detail below, each financial value in a set is calculated from a respective one of a plurality of financial formulas. Exemplary financial formulas may include, but are not limited to, liquidity ratios, asset management ratios, debt management ratios, profitability ratios, and market value ratios.

At least one of the financial values in each set is compared with one or more financial values associated with other business entities within a selected industry (Block 300). A score is assigned to one or more of the financial values in each set (Block 400). As described in detail below, each assigned score reflects an assessment of financial performance of the business entity relative to other business entities within the selected industry. For example, "Current Ratio" may be assigned a score of "strong", "good", "average" or "poor".

In addition, assigned scores for multiple time periods may be compared with each other to assess changes in financial performance from one time period to another time period (Block 500). For example, "Gross Profit Margin" for a selected time period may be assigned a score of "rise", "same", and "down" relative to "Gross Profit Margin" for another selected time period.

One or more portions of stored text that are

associated with one or more combinations of assigned scores are then selected from a database (Block 600). For example, scores for financial values generated from formulas related to "Income" are combined to produce an alphanumeric string. Exemplary financial formulas related to "Income" may include, for example, "Net Income Margin", "Net Income Margin Movement", "Net Income Movement", "Gross Profit Margin", "Gross Profit", and "Sales Percentage Change". An identifier for each formula, along with a respective score for each formula, can be concatenated to produce an alphanumeric string. An exemplary alphanumeric string is represented by "I-05g-06r-07s-08r-09r-10s", wherein "I" designates a set of formulas related to "Income"; wherein 05, 06, 07, 08, 09, and 10 identify respective formulas in the set of formulas related to "Income"; and wherein "g", "r", and "f" identify scores of "good", "rise", and "significant rise".

The one or more portions of selected text are then utilized to build a narrative financial analysis report for the business entity (Block 700). The generated narrative financial analysis report is then transmitted to a client device of a user via a computer network, such as the Internet (Block 800).

Referring now to **Figs. 3A-3C**, an exemplary HTML data entry form 40 for obtaining financial information from a user about a business entity for selected time periods is illustrated. The illustrated form 40 is served from the web server 14 of the intermediary web site 12 and is displayed within a

user's client (e.g., browser) 30. HTML forms are well known to those of skill in the art and will not be described further herein. Moreover, it is understood that various types and styles of data entry forms may be utilized in accordance with the present invention and that the present invention is not limited to the illustrated data entry forms set forth herein.

Using the displayed HTML form 40, a user selects a sales range via pull-down menu field 41 and the user selects two time periods via pull-down menu field 42. Exemplary sales ranges may include, but are not limited to, "Yearly sales under \$1 Million", "Yearly sales \$1 Million to \$10 Million", and "Yearly sales over \$10 Million". Exemplary time periods are listed below in Table 1.

Table 1

Time Period	Example
One month against the month that preceded it.	Comparing the financial results of March, 1999, to February, 1999.
One quarter against the quarter that directly preceded it.	Comparing the first quarter of 1999 to the last quarter of 1998.
One fiscal year against the previous fiscal year.	Comparing 1998 financial data to 1997 financial data.
A month from this year against the same month from last year.	Comparing March, 1998, financial results to March, 1997 financial results.
A quarter from this year against the same quarter from last year.	Comparing the first quarter of 1999 (January 1-March 31) to the first quarter of 1998.

In the illustrated HTML form 40, a user has selected a sales range of "Yearly sales \$1 Million to \$10 Million" in field 41 and time periods of "One fiscal year against the previous fiscal year" in field

42.

Next, a user enters various financial data within fields 43a-43j and 44a-44j for each of the selected time periods, respectively. For example, fields 43a-43j relate to the current selected time period, and fields 44a-44j relate to the previous selected time period. In the illustrated HTML form 40, a user enters the following financial data within respective fields for the two selected time periods:

Cost of Sales 43a, 44a; Net Profit Before Taxes 43b, 44b; Cash 43c, 44c; Accounts Receivable 43d, 44d; Current Assets 43e, 44e; Gross Fixed Assets 43f, 44f; Current Liabilities 43g, 44g; Total Liabilities 43h, 44h; and Total Employees + Full Time Contractors 43j, 44j.

Using pull-down menu field 45, a user selects a description of the industry for his/her business. An exemplary listing of industry/business descriptions for display within pull down menu field 45 is provided below in Table 2. It is understood that Table 2 is provided for illustration only and is not intended to be all inclusive.

Table 2

COMPUTER AND TECHNOLOGY SERVICES	
Computer Service Business	A computer service business; sells technical services and uses parts/components to service clients.
Computer Software Developer	Develops and then sells computer software.
Manufacture Computers	Makes computer hardware/components and basically provides service only for the products sold.
Retail Computers	Sells computers and software on a retail basis.

Wholesale Computers	Sells computer hardware/components and provides a lot of services and/or support.
RETAIL BUSINESSES	
Convenience Store	A convenience store.
Grocery Store	A grocery store.
Retail Jewelry Store	A retail jewelry store.
Standard Retail Business	A standard retail business; buys products at wholesale and sells them at retail.

SERVICE FIRMS	
Auto Repair	Fixes cars when they break and also sells parts.
Construction Company	a construction company. Builds residential or commercial buildings, or other structures.
Contract Research Organization	Provides Contract Research Organization (CRO) Services. Products are reports and studies.
Contractor	A contractor - installs materials using supplies and people. (Rugs, carpentry, roofs, etc.)
Day Care Center	A day care center; employees care for children.
Doctor's Office	Doctor's office or a medical facility.
Employment Agency	Places people; an employment agency.
Equipment Rental	Rents equipment and supplies.
Fast Food Restaurant	A fast food restaurant; has counter staff, not wait staff.
Health Club	A health club, a place where people can work out.
Hotel/Motel	A hotel/motel business.
Insurance Agency	Sells insurance products.
Law Firm	Provides legal services.
PR Firm	A public relations firm.

Printer

A printer; does professional printing or copying.

Using field **46**, a user assigns a name for the narrative financial analysis report to be generated in accordance with the present invention. In the illustrated embodiment, a user has indicated that his/her business is a Contract Research Organization (CRO) and that the name of the narrative financial analysis report to be generated is "Typical CRO Business".

Referring now to **Fig. 3B**, a user provides additional information via radio buttons **47**. In particular, using radio buttons **47a**, a user identifies the accounting method used by his/her business. Using radio buttons **47b**, a user identifies how long it takes to receive payment from a customer. Using radio buttons **47c**, a user identifies how long his/her business takes to pay a vendor/supplier. Using radio buttons **47d**, a user identifies how long he/she has been in business. Using radio buttons **47e**, a user identifies the accuracy of the financial statements for the business. Using radio buttons **47f**, a user identifies a factor that best levers profits in the business.

Once the above-described information is entered into the various fields of **Figs. 3A-3B**, a user can initiate processing of a narrative financial analysis report according to the present invention by activating the "Process My Report" button **48**.

In response to activation of the "Process My Report" button **48**, a set of financial values are

calculated for each selected time period using various financial formulas (ratios). Table 3 below lists an exemplary set of financial formulas for use in accordance with the present invention. It is understood, however, that Table 3 is not intended to be all inclusive.

Table 3

Formula Number	Formula Name	Calculation
1	Current Ratio	Current Assets/Current Liabilities
2	Current Ratio Change	(Current Ratio first period less Current Ratio second period)/Current Ratio first period
3	Quick Ratio	Cash plus Accounts Receivable/Current Liabilities
4	Quick Ratio Change	(Quick Ratio first period less Quick Ratio second period)/Quick Ratio first period
5	Net Income Margin	Net income before Taxes/Sales
6	Net Income Margin Change	(Net Margin first period less Net Margin second period)/Net Margin first period
7	Net Income Movement	(Net Income first period less Net Income second period)/Net Income first period
8	Gross Profit Margin Change	(Gross Profit Margin first period less Gross Profit Margin second period)/Gross Margin first period
9	Gross Profit Change	(Gross Profit first period less Gross Profit second period)/Gross Profit first period
10	Sales Change	(Sales first Period less Sales second period)/Sales first period
11	Debt Use	Percentage Change in Debt between periods/Percentage Change in Profits between periods
12	Debt Change	(Total Debt first period less Total Debt second period)/Total Debt first period
13	Use of Assets	(Percentage Change in Assets between periods)/Percentage Change in Profits between periods
14	Assets Change	(Total Assets first period less Total Assets second period)/Total Assets first period
15	Use of Employees	Percentage Change in Employees between periods/Percentage Change in Profits between periods
16	Employees Change	(Total Employees first period less Total Employees second period)/Total Employees first period

A score is then assigned to each financial value in each set. Exemplary scores used in accordance with the present invention include, but are not limited to, "Strong", "Good", "Average", "Poor", Significant Rise, "Rise", "Same", and "Down". **Tables 4-16** illustrate scoring ranges for various ones of the formulas listed in **Table 3** above. Each score is assigned according to Sales Range and Selected Time Periods, as illustrated.

Table 4

Current Ratio	Strong	Good	Average	Poor
Sales Under \$1,000,000				
Monthly	>2.0	1.8-2.0	1.6-1.8	<1.6
Quarterly	>2.0	1.8-2.0	1.6-1.8	<1.6
Yearly	>2.0	1.8-2.0	1.6-1.8	<1.6
Month against last year's month	>2.0	1.8-2.0	1.6-1.8	<1.6
Quarter against last year's quarter	>2.0	1.8-2.0	1.6-1.8	<1.6
Sales \$1MM-\$3MM				
Monthly	>2.5	2.5-2	1.7-2	<1.7
Quarterly	>2.5	2.5-2	1.7-2	<1.7
Yearly	>2.5	2.5-2	1.7-2	<1.7
Month against last year's month	>2.5	2.5-2	1.7-2	<1.7
Quarter against last year's quarter	>2.5	2.5-2	1.7-2	<1.7
Sales >\$3MM				
Monthly	>2.5	2.5-2	1.7-2	<1.7
Quarterly	>2.5	2.5-2	1.7-2	<1.7
Yearly	>2.5	2.5-2	1.7-2	<1.7
Month against last year's month	>2.5	2.5-2	1.7-2	<1.7
Quarter against last year's quarter	>2.5	2.5-2	1.7-2	<1.7

Table 5

Current Ratio	Rise	Same	Down
Sales Under \$1,000,000			
Monthly	>6%	6%- -6%	<-6%
Quarterly	>6%	6%- -6%	<-6%
Yearly	>12%	12%- -12%	<-12%
Month against last year's month	>12%	12%- -12%	<-12%
Quarter against last year's quarter	>12%	12%- -12%	<-12%
Sales \$1MM-\$3MM			
Monthly	>6%	6%- -6%	<-6%

Quarterly	>6%	6%- -6%	<-6%
Yearly	>12%	12%- -12%	<-12%
Month against last year's month	>12%	12%- -12%	<-12%
Quarter against last year's quarter	>12%	12%- -12%	<-12%
Sales >\$3MM			
Monthly	>6%	6%- -6%	<-6%
Quarterly	>6%	6%- -6%	<-6%
Yearly	>12%	12%- -12%	<-12%
Month against last year's month	>12%	12%- -12%	<-12%
Quarter against last year's quarter	>12%	12%- -12%	<-12%

Table 6

Quick Ratio	Good	Average	Poor
Sales Under \$1MM			
Monthly	>1.1	1.1-.8	<.8
Quarterly	>1.1	1.1-.8	<.8
Yearly	>1.1	1.1-.8	<.8
Month against last year's month	>1.1	1.1-.8	<.8
Quarter against last year's quarter	>1.1	1.1-.8	<.8
Sales \$1MM-\$3MM			
Monthly	>1.1	1.1-.8	<.8
Quarterly	>1.1	1.1-.8	<.8
Yearly	>1.1	1.1-.8	<.8
Month against last year's month	>1.1	1.1-.8	<.8
Quarter against last year's quarter	>1.1	1.1-.8	<.8
Sales >\$3MM			
Monthly	>1.1	1.1-.8	<.8
Quarterly	>1.1	1.1-.8	<.8
Yearly	>1.1	1.1-.8	<.8
Month against last year's month	>1.1	1.1-.8	<.8
Quarter against last year's quarter	>1.1	1.1-.8	<.8

Table 7

Quick Ratio	Rise	Same	Down
Sales Under \$1MM			
Monthly	>6%	6%- -6%	<-6%
Quarterly	>6%	6%- -6%	<-6%
Yearly	>12%	12%- -12%	<-12%
Month against last year's month	>12%	12%- -12%	<-12%
Quarter against last year's quarter	>12%	12%- -12%	<-12%
Sales \$1MM-\$3MM			
Monthly	>6%	6%- -6%	<-6%
Quarterly	>6%	6%- -6%	<-6%
Yearly	>12%	12%- -12%	<-12%
Month against last year's month	>12%	12%- -12%	<-12%

Quarter against last year's quarter	>12%	12%- -12%	<-12%
Sales >\$3MM			
Monthly	>6%	6%- -6%	<-6%
Quarterly	>6%	6%- -6%	<-6%
Yearly	>12%	12%- -12%	<-12%
Month against last year's month	>12%	12%- -12%	<-12%
Quarter against last year's quarter	>12%	12%- -12%	<-12%

Table 8

Income Margin	Good	Average	Poor
Sales Under \$1MM			
Monthly	>4%	1%-4%	<1%
Quarterly	>4%	1%-4%	<1%
Yearly	>4%	1%-4%	<1%
Month against last year's month	>4%	1%-4%	<1%
Quarter against last year's quarter	>4%	1%-4%	<1%
Sales \$1MM-\$3MM			
Monthly	>4%	1%-4%	<1%
Quarterly	>4%	1%-4%	<1%
Yearly	>4%	1%-4%	<1%
Month against last year's month	>4%	1%-4%	<1%
Quarter against last year's quarter	>4%	1%-4%	<1%
Sales >\$3MM			
Monthly	>4%	4%-1%	<1%
Quarterly	>4%	4%-1%	<1%
Yearly	>4%	4%-1%	<1%
Month against last year's month	>4%	4%-1%	<1%
Quarter against last year's quarter	>4%	4%-1%	<1%

Table 9

Income Margin	Rise	Same	Down
Sales Under \$1MM			
Monthly	>6%	6%- -6%	<-6%
Quarterly	>6%	6%- -6%	<-6%
Yearly	>6%	6%- -6%	<-6%
Month against last year's month	>6%	6%- -6%	<-6%
Quarter against last year's quarter	>6%	6%- -6%	<-6%
Sales \$1MM-\$3MM			
Monthly	>6%	6%- -6%	<-6%
Quarterly	>6%	6%- -6%	<-6%
Yearly	>6%	6%- -6%	<-6%
Month against last year's month	>6%	6%- -6%	<-6%
Quarter against last year's quarter	>6%	6%- -6%	<-6%
Sales >\$3MM			
Monthly	>6%	6%- -6%	<-6%

Table 10Table 11

- 30 -

Quarter against last year's quarter	>3%	3%- -3%	<-3%
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Table 12

Gross Profit	Rise	Same	Down
Sales Under \$1MM			
Monthly	>3%	3%- -3%	<-3%
Quarterly	>3%	3%- -3%	<-3%
Yearly	>3%	3%- -3%	<-3%
Month against last year's month	>3%	3%- -3%	<-3%
Quarter against last year's quarter	>3%	3%- -3%	<-3%
Sales \$1MM-\$3MM			
Monthly	>3%	3%- -3%	<-3%
Quarterly	>3%	3%- -3%	<-3%
Yearly	>3%	3%- -3%	<-3%
Month against last year's month	>3%	3%- -3%	<-3%
Quarter against last year's quarter	>3%	3%- -3%	<-3%
Sales >\$3MM			
Monthly	>3%	3%- -3%	<-3%
Quarterly	>3%	3%- -3%	<-3%
Yearly	>3%	3%- -3%	<-3%
Month against last year's month	>3%	3%- -3%	<-3%
Quarter against last year's quarter	>3%	3%- -3%	<-3%

Table 13

Sales % Change	Sig. Rise	Rise	Same	Down
Sales Under \$1MM				
Monthly	>20%	20%-3%	3%- -3%	<-3%
Quarterly	>20%	20%-3%	3%- -3%	<-3%
Yearly	>20%	20%-3%	3%- -3%	<-3%
Month against last year's month	>20%	20%-3%	3%- -3%	<-3%
Quarter against last year's quarter	>20%	20%-3%	3%- -3%	<-3%

Table 14

Assets	Sig. Rise	Rise	Same	Down
Sales Under \$1MM				
Monthly	>20%	20%-6%	6%- -6%	<-6%
Quarterly	>20%	20%-6%	6%- -6%	<-6%
Yearly	>20%	20%-6%	6%- -6%	<-6%
Month against last year's month	>20%	20%-6%	6%- -6%	<-6%
Quarter against last year's quarter	>20%	20%-6%	6%- -6%	<-6%
Sales \$1MM-\$3MM				
Monthly	>20%	20%-6%	6%- -6%	<-6%
Quarterly	>20%	20%-6%	6%- -6%	<-6%

Yearly	>20%	20%-6%	6%- -6%	<-6%
Month against last year's month	>20%	20%-6%	6%- -6%	<-6%
Quarter against last year's quarter	>20%	20%-6%	6%- -6%	<-6%
Sales >\$3MM				
Monthly	>20%	20%-6%	6%- -6%	<-6%
Quarterly	>20%	20%-6%	6%- -6%	<-6%
Yearly	>20%	20%-6%	6%- -6%	<-6%
Month against last year's month	>20%	20%-6%	6%- -6%	<-6%
Quarter against last year's quarter	>20%	20%-6%	6%- -6%	<-6%

Table 15

Employees	Good	Average	Poor
Sales Under \$1MM			
Monthly	>1.0%	.8%-1.0%	<.8%
Quarterly	>1.0%	.8%-1.0%	<.8%
Yearly	>1.0%	.8%-1.0%	<.8%
Month against last year's month	>1.0%	.8%-1.0%	<.8%
Quarter against last year's quarter	>1.0%	.8%-1.0%	<.8%
Sales \$1MM-\$3MM			
Monthly	>1.0%	.8%-1.0%	<.8%
Quarterly	>1.0%	.8%-1.0%	<.8%
Yearly	>1.0%	.8%-1.0%	<.8%
Month against last year's month	>1.0%	.8%-1.0%	<.8%
Quarter against last year's quarter	>1.0%	.8%-1.0%	<.8%
Sales >\$3MM			
Monthly	>1.0%	.8%-1.0%	<.8%
Quarterly	>1.0%	.8%-1.0%	<.8%
Yearly	>1.0%	.8%-1.0%	<.8%
Month against last year's month	>1.0%	.8%-1.0%	<.8%
Quarter against last year's quarter	>1.0%	.8%-1.0%	<.8%

Table 16

Employee Use	Sig. Rise	Rise	Same	Down
Sales Under \$1MM				
Monthly	>20%	20%-6%	6%- -6%	<-6%
Quarterly	>20%	20%-6%	6%- -6%	<-6%
Yearly	>20%	20%-6%	6%- -6%	<-6%
Month against last year's month	>20%	20%-6%	6%- -6%	<-6%
Quarter against last year's quarter	>20%	20%-6%	6%- -6%	<-6%
Sales \$1MM-\$3MM				
Monthly	>20%	20%-6%	6%- -6%	<-6%
Quarterly	>20%	20%-6%	6%- -6%	<-6%
Yearly	>20%	20%-6%	6%- -6%	<-6%
Month against last year's month	>20%	20%-6%	6%- -6%	<-6%
Quarter against last year's quarter	>20%	20%-6%	6%- -6%	<-6%

Sales >\$3MM				
Monthly	>20%	20%-6%	6%- -6%	<-6%
Quarterly	>20%	20%-6%	6%- -6%	<-6%
Yearly	>20%	20%-6%	6%- -6%	<-6%
Month against last year's month	>20%	20%-6%	6%- -6%	<-6%
Quarter against last year's quarter	>20%	20%-6%	6%- -6%	<-6%

Referring now to **Tables 17-22**, the possible scoring combinations for financial formulas associated with "Liquidity", "Income", "Assets", "Sales", "Borrowing", and "Employees" are listed, respectively.

Table 17

LIQUIDITY:	Formula #				
Current Ratio	1	Strong	Good	Average	Poor
Current Ratio Change	2	Rise		Same	Down
Quick Ratio	3	Good		Average	Poor
Quick Ratio Change	4	Rise		Same	Down
Net Income Margin Change	6	Rise		Same	Down
Net Income	7	Sig. Rise	Rise	Same	Down
Sales	10	Sig. Rise	Rise	Same	Down

Table 18

INCOME:	Formula #				
Net Income Margin	5	Good	Average		Poor
Net Income Margin Movement	6	Rise	Same	Down	
Net Income Movement	7	Sig. Rise	Rise	Same	Down
Gross Profit Margin	8	Rise	Same	Down	
Gross Profit	9	Rise	Same	Down	
Sales Percentage Change	10	Sig. Rise	Rise	Same	Down

Table 19

ASSETS:	Formula #				
Use of Assets	13	Strong	Good	Average	Poor
Total Assets Change	14	Sig. Rise	Rise	Same	Down
Current Ratio Movement	2	Rise		Same	Down
Net Income Margin Movement	6	Rise		Same	Down
Net Income Movement	7	Sig. Rise	Rise	Same	Down

Table 20

SALES:	Formula #				
Sales Percentage Change	10	Sig. Rise	Rise	Same	Down
Asset Movement	14	Sig. Rise	Rise	Same	Down
Employees Percentage Change	16	Sig. Rise	Rise	Same	Down

5

Table 21

BORROWING:	Formula #				
Use of Debt	11	Good	Average	Poor	
Debt change	12	Sig. Rise	Rise	Same	Down
Current Ratio Movement	2	Rise	Same	Down	
Net Income Margin Movement	6	Rise	Same	Down	
Net Income Movement	7	Sig. Rise	Rise	Same	Down

Table 22

EMPLOYEES:	Formula #					
Use of Employees	15	Good		Average		Poor
Net Income Movement	7	Sig. Rise	Rise	Same	Down	
Employees Percentage Change	16	Sig. Rise	Rise	Same	Down	
Asset Movement	14	Sig. Rise	Rise	Same	Down	

Referring now to **Tables 23-25**, the assigned scores for the financial formulas associated with

10

"Liquidity", "Income", and "Assets" are listed, respectively. Although not illustrated, it is understood that financial formulas are also associated with "Sales", "Borrowing", and "Employees", in a similar manner. The illustrated combination of assigned scores for "Liquidity" is defined as the alphanumeric string "L-01s-02r-03g-04r-06r-07f-10f". The illustrated combination of assigned scores for "Income" is defined as the alphanumeric string "I-05g-06r-07s-08r-09r-10s". Similarly, the illustrated combination of assigned scores for "Assets" is defined as the alphanumeric string "A-13s-14f-02r-06r-07f".

Table 23

LIQUIDITY:	Formula #	Score
Current Ratio	1	Strong
Current Ratio Change	2	Rise
Quick Ratio	3	Good
Quick Ratio Change	4	Rise
Net Income Margin Change	6	Rise
Net Income	7	Sig. Rise
Sales	10	Sig. Rise

Table 24

INCOME:	Formula #	Score
Net Income Margin	5	Good
Net Income Margin Movement	6	Rise
Net Income Movement	7	Sig. Rise
Gross Profit Margin	8	Rise
Gross Profit	9	Rise
Sales Percentage Change	10	Sig. Rise

Table 25

ASSETS:	F rmula #	Score
Use of Assets	13	Strong
Total Assets Change	14	Sig. Rise
Current Ratio Movement	2	Rise
Net Income Margin Movement	6	Rise
Net Income Movement	7	Sig. Rise

In the respective combinations of assigned scores, "I" designates a set of formulas related to "Income", "L" designates a set of formulas related to "Liquidity", and "A" designates a set of formulas related to "Assets". The various numbers in the respective combinations of assigned scores identify respective formulas in the set of formulas related to "Liquidity", "Income", and "Assets", respectively. The lower-case letters in the respective combinations of assigned scores identify scores assigned to the various formula values in the respective sets of formulas. One or more portions of text associated with each combination (alphanumeric string) of assigned scores are retrieved from a database (Fig. 1) and used to build a financial analysis report, as illustrated in Figs. 4A-4J.

According to an embodiment of the present invention, each alphanumeric string corresponds to one or more respective paragraphs (e.g., one or more sentences). This is illustrated below in Table 26.

Table 26

Alphanumeric String	Paragraph
S-10f-14f-16f	The company has done a good job in this area. Sales have risen significantly. In fact, sales are growing at a faster rate than the sales of most other companies in the industry. Even sales "scores" are based upon industry comparisons, and the firm is doing well. Although it is true that sales numbers in themselves are not that important, it's certainly good to increase performance in this key area over time. It looks like a significant number of people have been hired, and a significant amount of assets have been purchased as well. Let's try to think about which factor is most responsible for the sales increases. It may even be a factor that does not appear on the financial statements. It's important to identify what helps the company most in reaching its goals, so that the company can leverage that factor in the future.
S-10f-14f-16r	We're seeing nice results in this area. Sales have increased substantially. It looks like the company has also bought a substantial amount of assets, and it looks like additional people have been hired. The company is also generating more revenue per employee this period, a long run key performance indicator (KPI) in this particular industry. However, we won't draw too many conclusions in this section because the real goal is increasing profitability over time, as discussed in the profitability area. Sales increases, in and of themselves, do not tell us that much.
S-10f-14f-16m	Company sales have increased significantly. It looks like the firm has also added a substantial amount of fixed assets. If these assets have helped to drive sales higher, then the company should be generally pleased that the asset base is generating more sales dollars. Hopefully, this dynamic will help in earning greater profitability in the future. Let's also make a note that the employee base has stayed about the same as it was last period, so the firm is now generating more revenue per employee, which is a good sign. Pushing more revenue through each employee is a good START toward pushing more profitability through each employee.
S-10f-14f-16d	Sales are up significantly from last period, but the organization has actually reduced the employee base. This dramatically improves revenue per employee, which is another measure of effectiveness in this particular industry. It could also indicate that the firm was a little top heavy with employees before. After all, sales are now higher with fewer people on staff. However, let's never go too far in our analysis of sales activities. As we discussed in the last section, the real challenge of management is to continually work on profitability over time. The company has seen good general work in this area. The sales have grown at a faster rate than the sales of many competitors.

Illustrated in **Table 26** are four alphanumeric strings relating to Sales and a respective paragraph associated with each one of the alphanumeric strings. **Table 26** is a representation of only a portion of data storage, such as a table within a database, within which paragraphs for respective alphanumeric strings relating to "Liquidity", "Profitability", "Sales", "Borrowing", "Assets", and "Employees" may be stored.

Referring now to **Figs. 4A-4J**, a narrative financial analysis report **60** generated in accordance with the present invention is illustrated in HTML format. It is understood that narrative financial analysis reports generated in accordance with the present invention can be generated in various formats. The illustrated narrative financial analysis report **60** includes a title section **62**, a plurality of analytical sections **64-74**. Each analytical section **64-74** includes at least one or more sentences/paragraphs of text selected based on combinations of assigned scores, as described above. For example, in the Liquidity section **64** illustrated in **Fig. 4A**, the first, second and third paragraphs **64a**, **64b**, **64c** are associated with the combination of assigned scores for "Liquidity" ("L-01s-02r-03g-04r-06r-07f-10f"). Similarly, other paragraphs within the remaining sections of the illustrative narrative analysis report are selected from the database utilizing respective combinations of assigned scores.

In the illustrated report **60**, each analytical

section 64-74 includes a rating icon that provides an indication of the performance of a business entity in a particular analytical section 64-74. For example, the performance of the illustrated business in the

5 "Liquidity" section 64 is indicated via icon 65 as "poor." The performance of the illustrated business in the "Profits & Profit Margins" section 66 is indicated via icon 67 as "poor." The performance of the

10 illustrated business in the "Sales" section 68 is indicated via icon 69 as "good." The performance of the illustrated business in the "Borrowing" section 70 is indicated via icon 71 as "good." The performance of the

15 illustrated business in the "Assets" section 72 is indicated via icon 73 as "risky." The performance of the illustrated business in the "Employees" section 74 is indicated via icon 75 as "risky." In section 76, the raw data provided by a user is listed in tabular format.

In section 78 (illustrated in Fig. 4C), a

20 plurality of charts 80, 82, 84 are provided that illustrate selected liquidity, profitability, and resource indicators. In particular, chart 80 illustrates selected liquidity indicators for quick ratio and current ratio. For example, bar graphs 80a

25 and 80b indicate quick ratio for the business for the last period and the current period, respectively. Bar graph 80c indicates the average quick ratio of other businesses within the same industry. Similarly, bar graphs 80d and 80e indicate current ratio for the

30 business for the last period and the current period,

respectively. Bar graph 80f indicates the average current ratio of other businesses within the same industry.

Chart 82 illustrates selected profitability indicators for gross profit margin and net profit margin. For example, bar graphs 82a and 82b indicate gross profit margin for the business for the last period and the current period, respectively. Similarly, bar graphs 82c and 82d indicate net profit margin for the business for the last period and the current period, respectively. Bar graph 82e indicates the net profit margin of other businesses within the same industry.

Chart 84 illustrates selected resource indicators for the business. In particular, bar graph 84a indicates sales, bar graph 84b indicates net profit, bar graph 84c indicates debt, bar graph 84d indicates asset utilization, and bar graph 84e indicates employee utilization.

The foregoing is illustrative of the present invention and is not to be construed as limiting thereof. Although a few exemplary embodiments of this invention have been described, those skilled in the art will readily appreciate that many modifications are possible in the exemplary embodiments without materially departing from the novel teachings and advantages of this invention. Accordingly, all such modifications are intended to be included within the scope of this invention as defined in the claims.

Therefore, it is to be understood that the foregoing is

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